Cardamom

MAY 1979

"CARDAMOM"

n this issue onwards 'Cardamom' is ing to you as a monthly magazine. We e this change will be appreciated by all readers and wellwishers as we will ble to pass on information of topical ortance faster than before.

are also glad to inform that our subs- tion and advertisement rates have n reduced to 50% of the existing rates.

request for the continued cooperation our contributors, readers and advertis- in making the magazine more effective useful for serving the industry better.

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CARDAMOM

A Journal devoted to the promotion of Cardamom Industry in India

Vol. II MAY 1979 No. 3

in this issue

ON THE COVER

A Cardamom plant damaged by azhukal disease.

Editorial

PREVENTION IS....

The year 1978–79 brought creditable achievements to the cardamom plantation industry in India in the various fields of production, export, export earnings and unit value realisation. The production rose to 4000 M.T. and export earnings touched the peak level of Rs. 60 crores. The future of the industry is very bright in view of the expanding market we have and the monopoly India is having in the existing traditional markets.

To keep up the above tempo, it is imperative on our part to ensure a better crop in the coming years too. In order to achieve this goal, we have to insure the crop against destructive diseases that the ensuing rains may invite to the plantations. We have to give stress to this aspect with particular reference to Azhukal disease which had played havoc on the crop during the last few monsoons.

As the readers are aware cardamom plant is susceptible, at all stages of its growth, to the onslaught of various pests and diseases. Of these, the Azhukal disease makes its appearance in July and will be prevalent upto November - December. The peak period of incidence is August - September. The infection spreads from capsules to panicles and later to the base of the stem resulting in their decay.

Timely spraying with 1 per cent Bordeaux mixture has been found to be effective for the control of the disease. First spraying may be taken up during May-June before the onset of the South west Monsoon and the second round in early August and the third, if necessary, in September.

Taking into account the economic loss caused by this disease, the Board has launched a massive campaign to enlighten the cardamom growers of the detrimental effects of the disease on the plant and to educate them on the proper control measures to protect the plantations. During the campaign period the Board's staff will conduct group discussions and spraying demonstrations in the cardamom tracts

Considering the prevailing attractive prices of cardamom, the economic loss that the planter may incur as a result of large scale infestation of Azhukal disease can be alarming. It may even break the backbone of the industry

However, we have learned from experience that there is nothing like timely action. We do hope that the growers will give due consideration to this deadly disease and adopt timely protective measures.

INDIAN CARDAMOM: AN OUTLOOK INTO THE FUTURE

PAST:

Production Trend

Figures of production of cardamom in India during 1965-66 to 1978-79 are given below. The index numbers of production constructed taking 1965-66 as base year have also been given for exhibiting the trend.

Production showed a fluctuating trend till 1976-78. From 1977-78 onwards it has been showing an increasing trend. From a base level of 2000 - 2700 M.T. during the five year period 1965-66 to 1969-70, it has come to a level of 4000 M.T. The index numbers constructed also exhibits the trend as compared to 1965 66 the year previous to the formation of the Cardamom Board. The production during 1978-79 was double of that of 1965-66.

Export Trend

Figures of quantity of export of cardamom during 1965-66 to 1978-79 are given below along with the index numbers consructed taking 1965-66 as base year.

Till 1976-77 the export also has shown fluctuating trend proportional to the production. From 1977 - 78 it has shown a substantial increase. From a base level of 1140 - 1600 M. T. during the 5 years period 1965 - 66 to 1969 - 70, the volume of export has now been brought to the level of 2700-2900 M.T. This trend is clearly exhibited by the index numbers. In otherwords volume of export during 1978-79 was 2½ times of that of 1965-66.

Export Earning Trend

Figures of export earnings during 1965-66 to 1978-79 along with the index numbers (base year 1965-66) are given below.

Export earning which was ranging between Rs.4 crores to Rs 9 crores during 1965-66 to 1969-70 have substantially increased and reached the level of Rs. 48 crores to Rs. 60 crores during 1977-78 to 1978-79. In other wordsearnings during 1978 76 are 15 times of that of 1965-66. Such substantial growth rate has been seen rarely in other commodities with exemption to Marine Products, etc.

PRODUCTION TREND

Year	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	1671-72
Production(MT)	2000	2700	2400	2100	2300	3170	3785
INDEX	100	135	120	105	115	158	189
Year	1672-73	1973-74	1974-75	1975 76	1976-77	1977-78	1978-79
Production(MT)	2670	2780	2900	3000	2400	3900	4000
INDEX	134	139	145	150	120	195	200

EXPORT TREND

Year	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	1971-77
Qty.(MT)	1134	1590	1451	1291	1149	1705	2147
INDEX	100	140	128	114	101	150	189
Year	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
Qty (MT)	1384	1813	1626	1941	893	2763	2900
INDEX	122	160	143	171	79	244	256

EXPORT EARNING TREND

Year	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72
Value (Rs/crores)	4.23	7.96	7.03	6.74	8.93	11.22	8.03
INDEX	100	188	166	159	211	265	190
Year	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978 79
Value (Rs/crores)	6.85	11.55	13.32	19.38	14.03	48.44	60.00
INDEX	162	273	315	459	332	1146	1419

Export price Trend

Unit value of export of cardamom (per kg.) during 1965-66 to 1678-79 along with the index numbers (base year 1965-66) are:

Year	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72
Price (Rs./kg.)	37	50	48	52	78	66	37
INDEX	100	134	130	140	208	176	100

Year	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
Price (Rs./kg.)	40	64	82	100	157	175	205
INDEX	133	171	220	268	422	470	550

Export price also has shown substantial growth during the past as could be observed from the table.

What has been done in the past to attain the present level

1. Infusion of confidence in the minds of the growers for bestowing more attention on production.

2. Timely dissemination of all information pertaining to all aspects of the industry especially internal and international market situation, price trends, growth potential, etc. through publications, seminars, personal visits, etc,. to growers, traders, exporters, etc,

3. A unique system of Extension advisory services has been developed by which Board's technical and senior officials meet individual growers for educating and extending all assistance required in increasing the productivity.

4. Effective and quick communication facilities —Telephone. telex, etc–arranged in key centres

5. Campaigns for disease control, education programmes for adoption of modern cultivation methods as well as marketing campaigns were conducted throughout the producing areas and terminal markets.

6. Arrangements for liberal credit facilities for traders were made by contacting leading banking and other institutions.

7. Export advisory services.

8. Improved the system of internal marketing by implementation of Licensing Rules. A unique system of auctioning of cardamom was developed in the producing tracts ensuring smooth running of the trade and remunerative returns to the growers.

9. Motivating growers and the producers for re-investment.

10 Collection of all statistical data-national and international-for facilitating proper planning and dissemination of the same to all concerned through publications and personal dialogue.

11. Conducted market surveys in all the prime markets and action taken on the recommendations of the findings.

12 Exporters were motivated to visit foreign markets for canvassing orders.

13. Steps were taken to produce more green bold cardamom which fetches premium price in the prime markets.

14. Produced and supplied quality seedlings at reasonable price through departmental nurseries and other certified nurseries enabling the growers to produce more.

15. Better Labour relations were maintained so that production did not suffer on account of labour problems. Suitable labour welfare measures were taken with funds available.

16. Production-oriented publicity measures were taken.

17. Export promotion measures were also taken with the meagre funds made available for the purpose.

FUTURE:

Production

Production, export, price, etc. of cardamom have been showing an increasing trend in recent years Anticipated production during the coming year i e. 1979-80 is 4500 M.T. This may even go upto 5000 M.T. The production level can be brought to the level of 6000 M.T. in the immediate future provided we take necessary measures. In this context, it should be pointed out that other producing countries, viz. Guatemala, Tanzania, Sri Lanka and Papua New Guinea are also planning to increase their production. To keep the leadership and also to enjoy the favourable international marketing situation we should be fast in reaching higher production levels before others could do it.


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Exports

The provisionally targetted exports for 1979-80 is 3200 M.T. This may go even upto 3500 M.T. provided we take appropriate measures. The increasing trend in prices may not be a permanent phenomenon taking into account the availability of the commodity at cheaper rates from other supplying sources. Hence the export earnings anticipated is at the rate of Rs.200/-per kg. amounting to Rs.65 crores to Rs.70 crores. The exports in the coming years can increase upto 4000 M.T. to 4500 M.T. valued Rs.80 crores to Rs.90 crores which also depend upon the measures we implement.

What is to be done in the future

1. Rejuvenating the extension advisory service by employing senior technical officials with all infrastructure facilities.

2. Continuation of production and distribution of quality cardamom seedlings at reasonable prices.

3. Conducting repeated campaigns on disease control, adoption of modern cultivation methods, improved system of marketing, etc.

4. Research.

5. Expansion of area in potential localities.

6. Overall development of the producing tracts by providing more communication facilities, educational and hospital institutions, transport facilities, etc. In this context, it should be mentioned that 75% of the cardamom export is generated from a single Taluk in the High 'Ranges in Kerala viz. Udumbanchola Taluk. This Taluk although earns such high amount of foreign exchange lag behind many other Taluks in India and deserves immediate attention from the Government for development.

7. Sending sales delegations abroad (it has to be pointed out that so far Board has not sent any sales delegations abroad).

8. Opening of Board's market intelligence - cum - promotional office in the 'core' market viz. Middle East.

9. Undertaking consumer research and market surveys abroad.

10. Diversification of product and finding new end uses for cardamom.

11. Formation of international cardamom community. □

THE UNITED ARAB EMIRATES

Following is an excerpt on the United Arab Emirates from the report on the market survey jointly carried out by Cardamom Board and International Trade Centre, Geneva in the Middle East and West European countries. The survey team consisted of shri N. Bharathan Pillai, Market Development Officer, Cardamom Board and Mr. Brian Mc. Loughlin, Marketing Consultant, International Trade Centre, Geneva. Excerpts on Kuwait, Bahrain, Iran, Qatar and Saudi Arabia appeared in the preceding issues of "Cardamom"

—Editor.

INTRODUCTION

The seven States of the United Arab Emirates are a growing market for cardamom. Two States, Dubai and Abu Dhabi, are the main importing centres in the U. A. E. Dubai is also an important entrepot for cardamom, supplying other markets in the Gulf area including Saudi Arabia, Qatar, Bahrain and Iran. The total tonnage imported reached 234 tonnes in 1974.

IMPORT HISTORY

The import statistics for cardamom imports to the U. A. E. are not regarded as completely reliable. Two Emirates only—Dubai and Abu Dhabi—produce import figures and those for Abu Dhabi are available only for 1974 and 1975. Import data for the other Emirates—Sharjah, Ummal Quiwan, Ajman, Fujairah and Ras-al-Khaimah—is not available. It is understood, however, that the bulk of recorded imports to the U.A.E. are through Dubai and Abu Dhabi. The available import statistics are set out in Table-2 and shows a sharp increase in imports to Dubai, from 59 tonnes in 1971 to 182 tonnes in 1974. In 1975, there was a small drop in imports to Dubai to 160 tonnes and imports to Abu Dhabi also fell in 1975 as against 1974, in both cases by approximately 12 per cent.

In terms of market share and volume, India is the most important supplying country, though Guatemala has rapidly built market share both in direct supply and through re-exports from Bahrain.

Table-1

SHARE OF IMPORTS - VOLUME BASIS

Dubai

	1971 %	1972 %	1973 %	1974 %	1975 %
India	79.7	76.0	85.7	38.5	48.1
Sri Lanka	20.3	16.0	...	0.6	4.4
Bahrain	...	1.3	5.4	27.5	22.5
Guatemala	...	1.3	...	14.8	4.4
Tanzania	...	...	...	8.8	10.6
Others	...	5.4	8 9	9.8	10.0
	100.0	100.0	100.0	100.0	100.0

Abu Dhabi

	1971 %	1972 %	1973 %	1974 %	1975 %
India	N. A.	N. A	N. A.	64.0	86.0
Tanzania	N. A.	N. A.	N. A.	21.1	2.9
Guatemala	N. A.	N, A.	N. A.	...	5.4
U.S.A. (Guatemala)	N. A.	N. A.	N. A.	14.9	5.7
				100.0	100.0

SOURCE: Compiled from National Foreign Trade Statistics-Dubai-Abu Dhabi

This table illustrates the progress made by Guatemala in the U.A.E. market since the bulk of re-exports from Bahrain comprise Guatemalan cardamom. The cardamom apparently imported from the U.S.A, is also Guatemalan in origin. That listed in the import tables as from Kenya and Somalia is believed to be primarily Tanzanian in origin. Exports from India have shown an erratic pattern, but the general trend is upwards in volume terms Exports from India peaked in 1975-76 at 67 tonnes, more than three times the total exports in 1972-73. The bulk of exports are of Alleppey Green variety, though small quantities of bleached cardamom are also exported.

The import data is not, however, a reliable indicator of consumption levels. Only about 20 per cent of total imports are retained for consumption in the U.A.E.; the balance is re-exported to other consuming countries in he Gulf area —particularly Saudi-Arabia. Moreover, there are untrecorded imports as well as considerable inter-treding between Dubai and Abu Dhabi, which will distort the picture on consumption which can be extrapolated from the statistical data.

USAGE

Consumption of cardamom in the U.A.E is mainly in Gahwa— Arab style cardamom coffee The serving of Gahwa is a deeprooted feature of Arab social life. Gahwa is considered to cool the blood and is offered to all visitors to traditional. Arab homes and to important visitors to Government and Municipal Offices and business premises.

Table-2 (1)

IMPORT OF CARDAMOM TO DUBAI - BY SOURCE
1971 - 1975

Year	Source	Quantity (M.T.)	Value (Rs. '000s)	Value ($ '000s)
1971	India	47	1,363	189
	Sri Lanka	12	195	27
	TOTAL	59	1,558	216
1972	India	57	1,698	212
	Sri Lanka	12	120	15
	Bahrain	1	40	5
	Guatemala	1	24	3
	Kenya	4	48	6
	Saudi Arabia	Neg	Neg	Neg
	TOTAL	75	1.930	241
1973	India	96	4,317	531
	Bahrain	6	260	32
	Kenya	6	130	16
	U S.A.	4	146	18
	TOTAL	112	4 853	597
1974	India	70	3,692	457
	SriLanka	1	32	4
	Bahrain	50	2,674	331
	Guatemala	27	1,559	193
	Kenya	16	557	69
	U.S.A.	2	153	19
	Tanzania	16	509	63
	TOTAL	182	9,176	1,136
1975	India	77	5,755	644
	Sri Lanka	7	545	61
	Bahrain	36	3,244	363
	Guatemala	7	509	57
	Kenya	6	215	24
	U.S.A.	9	706	79
	Tanzania	17	948	106
	Somalia	Neg	36	4
	TOTAL	160	11,958	1,338

SOURCE: National Foreign Trade Statistics, Dubai

Table-2 (2)

IMPORTS OF CARDAMOM TO ABU DHABI BY SOURCE
1974 - 1975

(Data for 1971 - 1973 not available)

Year	Source	Quantity (M.T)	Value (Rs. '000s)	Value ($ '000s)
1974	India	37.8	694	86
	Tanzania	12.5	372	46
	U.S.A. (Guatemala)	8.8	380	47
	TOTAL	59 1	1,446	179
1975	India	45.0	1,170	131
	Guatemala	2 8	223	25
	U.S.A. (Guatemala)	3.0	89	10
	Tanzania	1.5	35	4
	TOTAL	52.3	1,517	170

SOURCE: National Foreign Trade Statistics-Abu Dhabi

In the U.A.E. the concentration of cardamom in Gahwa tends to be lower than in other Gulf countries. A decoction of 15 per cent cardamom to 85 per cent coffee is normal in this area, contrasting with the mix of 85 per cent cardamom to only 15 per cent coffee reported in parts of Saudi Arabia.

This low concentration of cardamom, and the consequent weaker cardamom taste of the Gahwa served in the U.A.E., has led to increased usage of Guatemalan cardamom, the taste of which is not so strong as that of Indian Cardamom.

Other usage of cardamom in the U.A.E is in cookery, in biryanis and curries. This usage is mainly by Indian and other non-nationals of the U.A.E who constitute some two thirds of the total population.

CONSUMER PATTERNS

The total number of people resident in the United Arab Emirates has recently been officially estimated to be 653,000 approximately. Of this, 220,000 are believed to be nationals of the seven emirates which together comprise the U.A.E. The balance of the population are immigrants. Temporary workers from India and Pakistan are the main constituents of the immigrant segment of the population, while a wide range of other nationalities include Jordanians, Palestinians, Egyptians, Iranians and Europeans.

The population are concentrated in the coastal strip, and outside the main towns, Dubai, Abu Dhabi and Sharjah. The U A E. is very sparsely populated and many inhabitants are semi-nomadic. Income levels vary considerably from place to place within the U.A.E., which is a federation of independent states rather than a single country. The oil wealth tends to be concentrated in the Emirate of Abu Dhabi, while consumers in Dubai, where there has been a long history of trading, derive their income mainly from trading. It is, therefore, impossible to define any general consumer profile for the U.A.E.

Much of the major expenditure of oil wealth, deriving principally from Abu Dhabi, has been allocated to capital projects such as ports, airports, etc, rather than on increasing personal incomes. Some expenditure on roads and communications has tended to increase consumer mobility and there has been major schemes to improve water supply and electricity services to outlying areas.

Levels of education are still quite low; while major strides in increasing educational capacity have been made, literacy still remains at a lower stride.

The Emirates are traditionally Muslim and their religious and social attitudes are conservative. Thus, the role of women in society, and as consumers, is very limited. All commercial activity, even at the retail level, is aimed at a male market, and the buying of cardamom, and of coffee for Gahwa, is strictly a male activity. Consumption levels vary but a peak of 250 g. per day has been noted among richer house-holds in Abu Dhabi.

Table – 3

EXPORT OF CARDAMOM FROM INDIA TO U. A. E.
1971 - 72 – 1975-76

Q – Quantity (metric tonnes)
V. Rs=Value (Rs. '000s)
V. US$ Value (US$ '000s)

Year	Grade	Dubai Q.	Dubai V Rs	Dubai V.US$	Abu Dhabi Q	Abu Dhabi V.Rs	Abu Dhabi V.US$	Total (U.A.E.) Q.	Total (U.A.E.) V.Rs	Total (U.A.E.) V US$
1971-72	Alleppey Green	20	806	106	3	86	11	23	892	117
	Coorg Green	—	—	—	—	—	—	—	—	—
	Bleached/ Bleachable	2	90	12	1	50	7	3	140	18
	Seeds	1	45	6	—	—	—	1	45	6
	others	1	23	3	Neg	29	4	1	52	7
	Total:	24	964	127	4	165	22	28	1,129	148
1972-73	Alleppey Green	12	762	95	1	61	8	13	823	102
	Coorg Green	1	26	3	—	—	—	1	26	3
	Bleached/ Bleachable	4	227	28	—	—	—	4	227	28
	Seeds	1	25	3	—	—	—	1	25	3
	Others	—	—	—	—	—	—	—	—	—
	Total	18	1,040	129	1	61	8	19	1,101	136
1973-74	Alleppey Green	52	3,316	409	1	40	5	53	3 356	414
	Coorg Green	9	608	75	—	—	—	9	608	75
	Bleached/ Bleachable	3	169	21	—	—	—	3	169	21
	Seeds	—	—	—	—	—	—	—	—	—
	Others	—	—	—	—	—	—	—	—	—
	Total	64	4,093	505	1	40	5	65	4,133	510
1974-75	Alleppey Green	44	3,872	455	1	82	10	45	3,954	465
	Coorg Green	3	269	32	—	—	—	3	269	32
	Bleached/ Bleachable	1	110	13	—	—	—	1	110	—
	Seeds	—	—	—	—	—	—	—	—	—
	Others	—	—	—	—	—	—	—	—	—
	Total	48	4,251	500	1	82	10	49	4,383	510
1975-76	Alleppey Green	51	5,091	572	7	680	76	58	5,771	648
	Coorg Green	1	92	10	—	—	—	1	92	10
	Bleached/ Bleachable	5	376	42	—	—	—	5	376	42
	Seeds	3	166	19	—	—	—	3	166	19
	Others	—	—	—	—	—	—	—	—	—
	Total	60	5.725	643	7	680	76	67	6,405	719

SOURCE: Cardamom Board, India

DISTRIBUTION

Cardamom is sold to the consumer by traditional souk-style shops, by "cold stores"—partly self-service outlets carrying a wide range of foods and consumer products, and by the five or six larger supermarkets which have been established in the larger towns.

Cardamom is sold loose from bulk in the traditional and "cold store" outlets, though there is increased prepacking by larger "cold stores" and the supermarkets. Prepack sizes of 250 g. and of 500g. have been observed. Retailers tend to store cardamom in wooden storage boxes, which in the more modern stores, have a glass panel so that the consumer can see the size and colour of the produce. Consumers will handle and inspect the cardamom prior to purchase, to ensure that the quality is consistent. Qualities sought particularly are good size and colour.

Retailers buy directly from importer / wholesalers in the larger towns, in quantities of 5–10 cases. 10 kilo cases are the usual unit of packaging for distribution. In rural areas there are some semi-wholesalers active in the market— larger retailers who also supply smaller retailers.

The bulk of trade buying is directly from the importer/ wholsalers. The trade estimate that 80 per cent of all trade is handled in this way, and some of the balance is direct retail selling by the importer wholesalers who

will supply any quantity, even down to 250g. if required.

Distribution margins are:

Importer/ wholesaler—Retailer
10-15 per cent

Retailer—Consumer
25-30 per cent

Margin levels usually appear to be at the upper ends of the ranges quoted above.

The trend in distribution is towards a decline in the importance of the souk type of outlet and there is an increase in the volume of business through "cold stores" and supermarkets. This trend has been accelerated by the major reconstruction of the Souk area in some of the towns. In Abu Dhabi, for instance, the Souk has been completely rebuilt in recent years and the traditional open-fronted stalls have been replaced by permanent shops.

An important consumption segment of the market for cardamom is the Government and the Military. The Rulers' houses of all seven Emirates are important buyers of cardamom both for domestic consumption and for serving to the large numbers of official visitors to the Rulers, and for use in the official guest houses. Also, the Federal Government offices are large buyers, as are the Defence Forces and Municipalities of the various Emirates.

This market segment is supplied by the importer / wholesalers and increasingly this business is put out to tender. Total quantities involved are impossible to quantify but the Defence Forces in Abu Dhabi alone buy about 13-14 tonnes of cardamom annually.

IMPORT PRACTICES

The importer / wholesalers of the United Arab Emirates are based mainly in Dubai and Abu Dhabi. Dubai, long established as a port and trading centre, is the most important importing point both for re-export to Saudi Arabia and for the smaller home market in the U.A.E. Importers of cardamom in Dubai tend, therefore, to be larger and more actively involved in cardamom trading, while those in Abu Dhabi, Sharjah and Al-Ain are importing primarily to meet local market demand.

Cardamom from India is imported direct from Bombay on a C&F basis; there are frequent and direct shipping connections between Dubai and Bombay. Accordingly, Indian supplies can be delivered in under a week.

Cardamom from Guatemala is normally bought through brokers, in London, Hamburg or Zurich, or through the agents of Guatemalan exporters in Bahrain. Shipments direct from Guatemala take approximately four months via New Orleans. Some improvement in shipping times from Guatemala has been achieved by trans-shipment by road from North European ports, particularly Hamburg.

The main criterion for the source of supply tends to be price, though quality is also important with bold size and uniform green colour. For the domestic U.A.E. market, strength of flavour is of less importance, which gives Guatemala some market advantage as the external characteristics of this cardamom is usually superior to, and more consistent than, cardamom from India.

Purchase is universally against sample, and in this market also there is considerable evidence of marked variations between the quality of the sample, submitted and that of bulk shipment received.

Terms of business are usually against Irrevocable Letter of Credit both for supplies from Guatemala and India.

Delivery is sought case-packed. Whitewood cases with polythene liners of 10 kg are preferred, five cases to a shipping unit. This form of packaging allows onward sale to retailers without opening the individual cases.

There is very little awareness at importer level of Agmark grades.

TARIFFS AND REGULATIONS

Tariffs on cardamom in the U.A.E. vary, depending on the individual Emirate to which it is imported. In Dubai there is a duty of 3 per cent. In Abu Dhabi foodstuffs are imported free of all duty. No other regulations or restrictions apply to the importation of cardamom.

PROMOTION

No promotion of cardamom has been undertaken in the U.A.E.

DEMAND ASSESSMENT

In the internal market in the U.A.E. there is a firm upward demand trend for cardamom. Total consumption in Abu Dhabi alone is already estimated to be in excess of 100 tonnes, while demand in Dubai is at least as

large. In addition, there is demand from other Emirates.

It can be concluded, therefore, that the U.A.E. is rapidly changing from being primarily a trans-shipment and trading market to a significant point of final consumption for cardamom. It is also clear that the import data availalbe is probably a serious underestimate of the volume of cardamom entering the Emirates for consumption or onward trans-shipment, since recorded imports are broadly in line with current demand estimates, while there is strong evidence of continuing trans-shipments and re-exports from Dubai.

This contradiction can be explained only in terms of a large volume of unrecorded imports from other Gulf States. The most likely source of the bulk of these imports is Bahrain, though imports by land from Oman is also probable. That Bahrain is an important source of unrecorded imports is further confirmed by the high incidence of Guatemalan cardamom in retail outlets. The widespread distribution of this cardamom is inconsistent with the relatively small Guatemalan share of recorded imports.

Trade sources have confirmed the acceptability of Guatemalan cardamom among consumers, concerned less with taste rather than size and colour. The situation existing today can be explained only by the Guatemalan supplies being used to supply local demand, while the Indian Cardamom imported is mainly destined for re-sale in neighbouring markets, principally Saudi Arabia. Total demand from the U.A.E. for consumption and re-export is alredy probably as much as 300-350 tonnes when supplies are available in the world market. The Indian share of this market has been falling, even though the volume of exports has shown an upward trend. India is also losing effective penetration at the retail selling point, as a substantial proportion of the Indian Cardamom retained in the U.A.E. goes to satisfy the institutional demand from Government, Army and Municipal customers.

PROPOSED STRTAEGIES

Indian exporters must act aggressively to regain a dominant position in the U.A.E. market. The main strategic need is for adequate supplies of the right quality of cardamom—good size, a consistent colour and free of blemishes. These characteristics are more important to the U.A.E consumer than the strong taste of Indian Cardamom which is the strong product advantage in some other Gulf markets.

Supplies of cardamom of the correct quality are required over a more extended period than at present. Cardamom consumption in the U.A.E. is year-round, with seasonal peaks prior or during the Haj and Ramadan festivals. Supplies of good quality cardamom from India are available only during a period of 3—4 months each year. In contrast, Guatemalan suppliers are able to provide supplies through their local agents, over a much longer period each year. The Guatemalan cardamom has, therefore, become the accepted quality and standard for consumption, while Indian Cardamom is more likely to be sold onwards or traded. Thus, Indian Cardamom is supplying a much more volatile sector of the market in the U.A.E.

It is necessary, therefore, to re-establish the reputation of Indian Cardamom at the consumer level. Promotion of cardamom consumption is not necessary, in view of the existing upward trend. Already, the films used by the local television services during the regular prayer intervals, feature a boiling Gahwa pot, thus providing a regular quasi - advertising incentive to cardamom consumption.

To improve the image of Indian Cardamom, careful attention to quality control is essential. Consumers in the U. A.E. demand large-sized green cardamom, and lesser qualities are not in demand from the Arab population who are able to pay high retail prices.

A point-of-sale reminder of the quality and reputation of Indian Cardamom is also necessary to overcome the better appearance of the Guatemalan competition and to sell the superior taste and aroma of the Indian produce.

For the institutional market much closer links must be established between Indian exporters and the major importers in the U. A. E. who supply the Government departments, Defence Forces, and Municipal contracts. Only if there are close links with these importers and regular interchange of information on likely demand, prevailing prices and qualities available, can Indian exporters expect to satisfy the requirements of this important and discerning segment of the market

ANNEX I

Principal importers of Cardamom - Abu Dhabi

Abdulla Hussain & Sons,
P. O. Box No. 286,
Abu Dhabi.

Adel Trading Stores,
P. O. Box No. 971,
Abu Dhabi.

Akhund Abu Dhabi Stores,
P. O. Box No.80,
Abu Dhabi.

Ibrahim Trading Stores,
P. O. Box No. 408,
Abu Dhabi.

Khoory Stores,
P. O. Box No. 764.
Abu Dhabi,

Abdulla & Abdul Rahim Shaibani,
P. O. Box No, 1092, Al-Ain,
Abu Dhabi.

Albert Adela,
P. O. Box No. 143,
Abu Dhabi.

Ansari Super Market,
P. O. Box No. 951,
Abu Dhabi.

Elite Stores,
P. O. Box No. 160,
Abu Dhabi.

Hasani Super Market,
P. O. Box No. 470,
Abu Dhabi.

Tikamdas and Sons,
P. O. Box No. 321,
Abu Dhabi.

Abu Dhabi General Stores,
P. O, Box No. 288,
Abu Dhabi.

Al-Afrah Traders,
P. O. Box No. 715,
Abu Dhabi.

Ali Abdulganj Ali Khoory,
P. O. Box No, 720,
Abu Dhabi.

Khoory Grocery,
P. O. Box No. 302,
Abu Dhabi.

Mohd. Rasool Khoory & Sons Stores,
P. O. Box No. 126,
Abu Dhabi.

Ghuloom Ali Abdulla Khoory Stores,
P. O. Box No. 1047,
Al-Ain, Abu Dhabi.

Ansary Co.,
P. O. Box No. 444,
Abu Dhabi.

Eastend Commercial Company,
P. O. Box No. 2170,
Abu Dhabi.

Emke Stores,
P. O. Box No 61
Abu Dhabi

Salama Stores,
P. O. Box No. 2345,
Abu Dhabi.

ANNEX II

Principal importers of Cardamom - Dubai

United Rice Co. (Dubai) Ltd.,
Post Box No. 2229,
Dubai.

Yousuf Akbar Ali Reza,
Post Box No 543,
Dubai.

Sh. Ghulam Abbas & Abdul Hussein Ansari,
Post Box No. 83,
Dubai.

Ahmed Sharif & Sons,
Post Box No, 589,
Dubai.

Jawad Haji Abdul Hussain Sejward & Co,
Post Box No. 178,
Dubai.

Ahmed Resa Poor,
Post Box No: 467,
Dubai.

Sharjah Trading Co.,
P. O. Box No 2210,
Dubai.

Globe Trading Agency Ltd.,
G. P. O. Box No. 394, Dubai.

Meetco,
C/3 Regent Street,
P. O. Box No.1356,
Dubai. □

Improved Groundnut Varieties

The Bhabha Atomic Research Centre (BARC), Bombay, using radiations to induce genetic changes in the characters contributing to yield, isolated two mutants in the popular groundnut variety, 'Spanish Improved'. 'TG-1' with large seed (0.82 gm/seed) and 'TG-3' with normal seed (0.50gm) size were officially released for cultivation in 1973. 'TG-14, 16, 17 and 19 were evolved subsequently. It may be emphasized that the seed weight of 'TG-19' (1.25 gm/seed) is two and a half times more than that of the unirradiated parent. Large sized kernels are preferred for 'table purpose'. The exporters of HPS (Hand Picked Selection grade) groundnut are very much interested in 'TG-1' and 19 as these kernels would fetch a premium in the international market.

Exports of about 60,000 tonnes of present grade HPS groundnut earn approximately 45-50 million US dollars annually.

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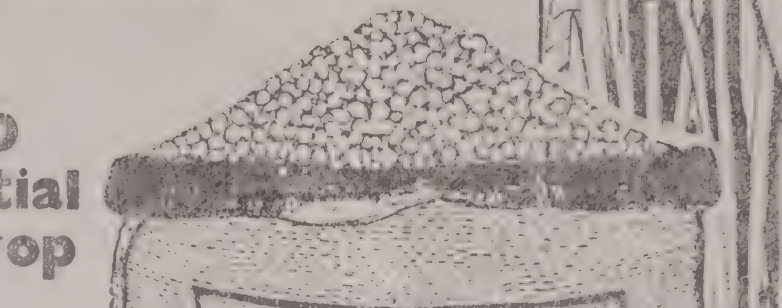

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ARIES-FACT/780

MONTHLY STATISTICAL ABSTRACT
APRIL 1979

PRODUCTION

Production of cardamom for 1978-79 season is estimated as 4000 M.T. with state-wise break up as

Kerala	2900 M . T.
Tamilnadu	300 M . T.
Karnataka	800 M . T,
Total	4000 M. T.

AUCTION SALES & PRICES

The position of state-wise auction sales and weighted average prices for April 79 and the cumulative position during 1978-79 season with comparative position for the previous season are given in the following table.

State	April 79 Qty (MT)	April 79 Av. Price (Rs/Kg)	April 78 Qty (MT)	April 78 Av. price (Rs/Kg)	Aug-April 79 Qty (MT)	Aug-April 79 Av. Price (Rs/Kg)	Aug-April 78 Qty (MT)	Aug-April 78 Av. Price (Rs/Kg)
Kerala	3	137 98	31	147.39	2416	178.71	2301	142.65
Tamilnadu	28	126.12	14	131.74	175	140.04	137	116.18
Karnataka	60	135.08	25	123.91	630	133.96	524	103.92
Total	91	132.43	70	135.78	3221	167.86	2962	134.63

During the current season auction sales in Kerala were practically over by the end of March 79. while in Tamilnadu and Karnataka the sales continued. The cumulative position of sales and prices during 1978-79 is much better than that of the previous year. The highest average price recorded at Vandanmettu auction during the current year was Rs. 210.90 per kg in October 78 as against Rs. 169.93 per kg in December 77 during the previous season. Month-wise sales and trend in prices at different auction centres in Kerala, Tamilnadu and Karnataka are given elsewhere.

EXPORTS

Export of cardamom during April 79 was 245 M. T. valued at Rs.4.69 crores as per reports received from the Customs Authorities based on shipping bills passed and cess/duty collected.

We have received so far details for about 126 MT valued at Rs. 2.43 crores from the exporters. Export during April 78 was only 220 MT valued at Rs.3.75 crores. The unit value of export realised during April 79 was Rs. 191.47 per kg as against Rs.170.27 per kg during April 78.

Anticipated Production & Export for 1979-80

PRODUCTION

It is too early to have a precise estimate of production for the next season 1979-80. However, based on the present field observations 500 MT more are expected during the ensuing season. Thus the anticipated crop for 1979-80 is 4500 M . T .

EXPORT

The provisional target of export for 1979-80 is 3200 MT with an earning of Rs.65 crores. This may even go up to 3500 MT valued at Rs.70 crores provided actual production goes up beyond 4500 MT and also appropriate export promotion measures are implemented. The increasing trend in price may not be a permanent phenomenon considering the supplies from other producing countries at cheaper rates. Hence the export price anticipated is at the rate of Rs.200/- per kg. ☐

Month-wise Centre-wise Auction Sales and Prices during 1978-79

(August 1978 - April 1979)

Centre	AUGUST 1978			SEPTEMBER 1978			OCTOBER 1978			NOVEMBER 1978			DECEMBER 1978		
	Qty. sold (kgs.)	Max. price (Rs./kg.)	Av. price (Rs./kg.)	Qty. sold (kgs.)	Max. price (Rs./kg.)	Av. price (Rs./kg.)	Qty. sold (kgs.)	Max. price (Rs./kg.)	Av. price (Rs./kg.)	Qty. sold (kgs.)	Max. price (Rs./kg)	Av. price (Rs./kg.)	Qty. sold (kgs.)	Max. price (Rs./kg.)	Av. price (Rs./kg.)
KERALA															
Vandanmettu	6476	207.40	164.26	168655	230.00	191.96	419798	260.00	199.59	296166	230.00	184.81	235626	236.10	181.29
Santhanpara	31411	195.00	161.44	76848	230.10	184.83	115625	230.20	182.68	92654	229.00	173.46	56802	223.30	165.61
Udumbanchola	4387	175.00	158.38	21273	220.00	183.03	30030	204.00	180.26	17525	200.10	173.55	23095	204.10	165.57
Kallar	12323	190.10	163.28	30535	219.70	177.23	31167	218.00	170.04	52609	226.50	163.89	26018	189.30	154.84
Cochin	—	—	—	1055	207.10	190.42	6281	215.20	184.00	6322	235.10	176.21	8841	230.10	166.62
Parathode	—	—	—	8622	213.00	187.89	19013	217.50	182.69	17528	205.10	176.32	7392	192.10	173.03
Total (Kerala)	54597	207.40	161.94	306988	230.10	187.97	621914	260.00	193.36	482804	230.00	179.52	357774	236.10	175.33
TAMILNADU															
Pattiveeranpatty	4744	190.00	144.77	10636	220.00	161.22	19795	214.00	157.47	22467	205.00	153.81	22240	230.00	149.22
Bodinayakanur	—	—	—	1714	195.50	160.85	2227	193.20	152.82	771	171.10	143.78	4973	185.00	140.22
Total(Tamilnadu)	4744	190.00	144.77	12350	220.00	161.17	22022	214.00	157.00	23238	205.00	153.48	27213	230.00	147.58
KARNATAKA															
Mercara	854	165.00	145.00	7200	180.00	147.97	6745	169.50	148.89	1225	186.00	140.25	399	150.50	139.45
Mangalore	76	150.00	139.84	1023	167.00	147.75	8825	175.50	147.97	11154	171.00	144.18	275	147.50	128.00
Saklaspur	2200	197.70	150.52	33065	246.10	149.72	92316	261.20	144.35	92291	238.00	137.12	59467	235.00	120.26
Sirsi	167	145.77	136.87	157	156.83	138.13	2979	161.55	133.30	2782	152.09	126.29	1552	138.79	124.39
Mudigere	—	—	—	1884	169.20	145.40	6409	201.10	136.85	5133	159.00	129.95	1519	151.00	127.11
Total (Karnataka)	3297	197.70	148.15	43329	246.10	149.15	117274	261.20	144.19	112585	238.00	137.26	63212	235.00	120.68
Grand total(India)	62638	207.40	159.91	362667	246.10	182.42	761210	261.20	184.73	618627	238.00	170.85	448199	236.10	165.94

Centre	JANUARY 1979			FEBRUARY 1979			MARCH 1979			APRIL 1979			Total (August 1978–Ayril 1979)		
	Qty. sold (kgs.)	Max. price (Rs./kg.)	Av. price (Rs./kg.)	Qty. sold (kgs.)	Max. price (Rs./kg)	Av. price (Rs./kg.)	Qty. sold (kgs.)	Max. price (Rs./kg.)	Av. price (Rs./kg.)	Qty. sold (kgs.)	Max. price (Rs./kg)	Av. price (Rs./kg.)	Qty. sold (kgs.)	Max. price (Rs./kg.)	Av. price (Rs./kg.)
KERALA															
Vandanmettu	258430	236.40	175.81	103189	216.00	158.26	104700	221.90	145.20	—	—	—	1593040	260.00	183.07
Santhampara	49128	213.10	155.53	19229	202.00	138.24	18332	175.20	125.51	2669	169.90	137.98	462698	230.20	170.40
Udumbanchola	6742	184.90	152.47	2760	187.50	152.45	888	167.00	146.46	—	—	—	106700	220.00	172.87
Kallar	6635	186.10	134.70	—	—	—	—	—	—	—	—	—	159287	226.50	164.91
Cochin	1795	192.90	154.68	2396	199.90	153.21	—	—	—	—	—	—	26690	235.10	171.92
Parathode	14008	203.10	168.69	1597	186.00	163.00	—	—	—	—	—	—	68160	217.50	177.32
Total (Kerala)	336738	236.40	171.17	129171	216.00	155.12	123920	221.90	142.30	2669	169.90	137.98	2416575	260.00	178.71
TAMILNADU															
Pattiveeranpatty	15206	206.10	138.60	15836	198.00	131.77	15322	209.10	123.54	23297	206.10	130.79	149543	237.00	143.28
Bodinayakanur	2535	183.60	127.39	2989	160.50	103.14	5825	152.10	98.81	4410	152.10	101.43	25444	195.50	120.98
Total (Tamilnadu)	17741	206.10	137.00	18825	198.00	127.22	21147	209.10	116.73	27707	206.10	126.12	174987	230.00	140.04
KARNATAKA															
Mercara	1129	166.50	143.00	—	—	—	6145	146.50	133.84	—	—	—	23697	186.00	143.67
Mangalore	17321	175.50	143.47	1560	141.00	122.00	14580	157.00	133.00	15497	170.00	138.96	70311	175.50	140.58
Saklaspur	77243	206.20	127.20	48326	195.00	124.14	55390	176.90	124.66	42475	180.10	134.39	502773	261.20	132.97
Sirsi	249	133.59	123.41	—	—	—	116	133.16	109.00	260	120.65	117.50	8262	161.55	128.29
Mudigere	3728	165.00	122.96	2444	154.30	108.38	1764	162.10	115.06	2000	167.70	122.02	24881	201.10	127.87
Total (Karnataka)	99670	206.20	130.04	52330	195.00	123.43	77995	176.90	126.70	60232	180.10	135.08	629924	261.20	133.96
Grand total (India)	454149	236.40	160.81	200326	216.00	144.22	223062	221.90	134.42	90608	206.10	132.43	3221486	261.20	167.86

Source: Auction reports received from licensed Cardamom Auctioneers.

Plant Protection Equipments at Subsidised Rate

Pests and diseases of agricultural crops are as old as agriculture itself. It has been estimated that more than 50% of the world's total crop production is lost each year as a result of the damages caused by pests and diseases of plants in spite of many control measures that are employed. The importance of reducing this loss particularly in the wake of attractive prices hardly needs emphasis. Effective control measures are to be urgently adopted to avoid this alarming loss caused by pests and diseases both in the field and in the store.

Plant protection operations play a very important role in the economy of cardamom plantations since the plant is susceptible to various pests and diseases at all stages of its growth. Due to the change in the agro-climatic conditions in the cardamom growing tracts and consequently the change in cultivation practices, pests and diseases hitherto considered to be minor have been very serious in certain tracts and take a heavy toll of the crop every year.

Damages due to pest and disease infestation are severe both in nurseries as well as in plantations. About 46 species of insects are reported to be associated with cardamom. In the nursery stage it become necessary to take up fungicidal applications in a systematic manner to keep the seedlings free from fungal diseases like damping off, leaf spot etc. Pests like shoot and rhyzome borers, mites, caterpillars etc. have to be controlled for which regular insecticidal application is required. Similarly in plantations incidence of pests like thrips, aphids, white flies etc. and diseases lika Azhukal, Katte, Chenthal etc, require effective plant protection operations to control them. This necessitates the planters to go in for spraying or dusting of plant protection chemicals practically all through the year.

The small growers (below 8 hectares) predominate in the field of cardamom plantations accounting for 94% of the total growers and 52% of the total area. These small growers who are the backbone of the industry lag behind in adopting timely plant protection operations for want of plant protection equipments of their own. Majority of the planters do not possess these equipments due to financial constraints and high cost of the equipments.

Considering these constraints, the Board has come forward with a new scheme for giving an incentive for small growers for acquiring plant protection equipments of their own. A subsidy to the tune of 25% of the cost of equipment is given to hand operated sprayers, dusters etc. However, power operated equipments are not given this subsidy since they are costly and are often beyond the reach of the small growers. Further it has been noticed that hand operated machines are better suited for handling in small holdings.

A registered cardamom planter owning not more than eight hectares of plantation is eligible to avail this concession for plant protection equipments. Preference in the supply will be given to small growers who are members of the cardamom growers' clubs, functioning in the cardamom tracts.

The planters desirous of getting the equipment should apply in the prescribed form along with an Earnest Money Deposit of 25% of the approximate cost of the equipment. 50% of the cost bringing the total amount to 75% of the actual cost should be remitted by the applicant soon after his request is accepted by the Board. The balance 25% will be treated as subsidy. On receipt of the cost of equipment as above, standard equipments as per choice of the applicants will be arranged to be supplied. Cardamom growers owning not more than 4 hectares are entitled to get a hand operated sprayer of about 12 to 14 litres capacity and a hand operated duster of about 4 kgs capacity. Cardamom growers owning more than four hectares but not more than eight hectares are eligible to get a maximum of two sprayers and a duster. □

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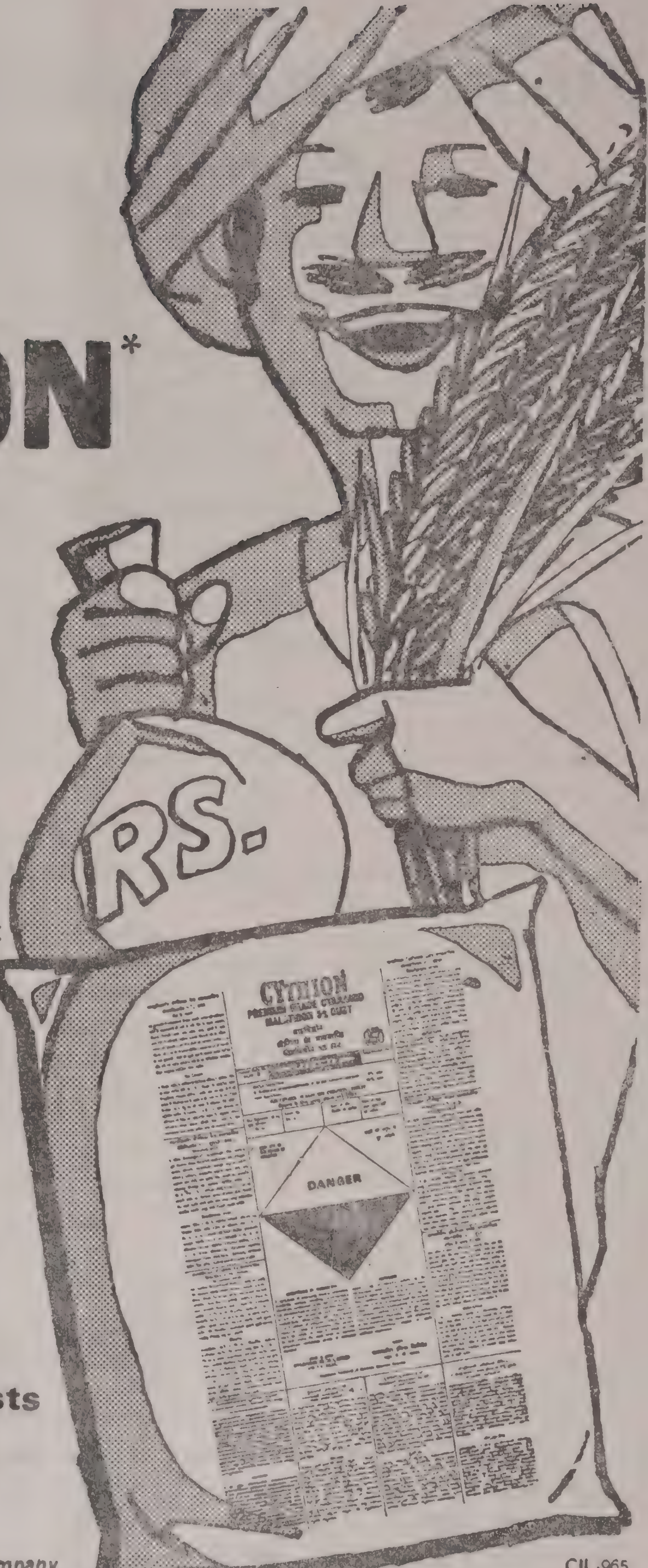

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CIL-965

News and Notes

.M. Appeals for liberal Contributions to National Childrens Fund

The Prime Minister Shri. Morarji Desai has in a statement ppealed to the business, industrial houses and the citizens to contribute in a big way to the National Childrens Fund launched by the Government with he objective of providing financial assistance to voluntary organisations for taking up programmes for the welfare of children particularly those belonging to scheduled castes/tribes and destitute children. The nternational year of the child has given fillip to the activities of the govt. and its national plan of action lays down the measures to be taken to provide nutrition, health and education o children. It is felt that voluntary organisations have an important role to play in the welfare and development of children who are the "Nations supremely important asset". Development of his human asset has been government objective and programmme have been drawn up ot achieve this.

Contributions to the fund are exempt from Income tax Contributioncan be addressed to the Secertary Treassurer, National Childrens Fund,Shasthri Bhavan, NewDelhi 110001.

Farm Front: No Room For Complacency

During 1977-78, foodgrains output is reported to have touched an all time high of 125 million tonnes. This is about 2.5 times the level of output in 1950-51. The production potential of Indian agriculture has improved considerably so that even in a year characterised by poor monsoons, a harvest of 110 million tonnes is a distinct possibility.

However, when the trends in production of agricultural commodities are studied in conjunction with the growth in population, the picture that emerges is far less sanguine.

This is underscored by the steady decline in the per capita availability of foodgrains since 1960–61. In contrast, during the fifties there was a marked rise in the percapita daiy availability of both cereals and pulses which strongly suggests that in relation to growth in population, the growth rate of foodgrains output has acclerated, generally speaking, from 1960-61.

The official compound growth rates of production of foodgrains for the fifties and the subsequent period corroborate this fact During the period 1949-50 to 1959-60, foodgrains output increased at an annual rate of 3.30 per cent; but this rate dropped to 2.25 per cent per annum between 1960-61 and 1976-77 Among the foodcrops, the performance of pulses is very disappointing. Their production declined at a rate of 0.63 per cent per annum between 1960-61 and 1976–77. The area, too, declined at 0.55 per cent in the same period and yields increased at just 0.08 per cent per year.

The per capita daily availability of foodgrains improved from 395 grammes in 1951 to 468 grammes in 1959; however between 1960-61, despite fluctuations, the per capita availability tended to decline. In 1977, it stood at 439 grammes which is less than what it was in 1959. It is thus evident that the growth in foodgrains production has lagged behind during the sixties and the seventies· —The Economic Times

A New Way To Control Waterweeds

Control of aquatic vegetation has always been difficult. Methods or products used either interfered with the ecology of the body of water treated, or was harmful to animals and beneficial plants. A new system has been developed using a product called Aquashade. It is based on cutting the light by mixing this new product with the surface water.

Aquashade imparts a "natural" blue colour to the water, eliminating certain wavelengths that make waterweeds grow. Although it is not recommended for water running in rivers or canals, its use is economical in lakes and ponds. The product helps control weeds by impeding their growth rather than poisoning them. Actually, some plant growth is desirable in waters to provide shelter and food to forms of life living there.

Aquashade is a bio-degradable product which reduces the light necessary for algae and weeds to grow. It does not affect animals, fish or humans.

The product can be poured from shore or from a boat into bodies of non-running water. The application must concentrate near the sides, where the plants tend to grow more abundantly. Four litres of Aquashade are applied for every 5000m² of water surface. Winds, currents and craft movement usually suffice to mix it in.—World Farming.

National Income on the Increase

The quick estimates of national income for the year 1977/78 release by the Central Statistical Organisation along with the annual white paper on national accounts statistics, 1970-71 to 1976-77 show the net national income of India at Rs. 43,395/- in 1977-78 against Rs. 40,395/- in 1976-77.

According to the estimates, there was a substantial increase in both national income and in per capita income during 1977-78. The increase in national income was 7.4 per cent at 1970–71 prices over the previous year. The per capita national income in 1977-78 increased by 5.2 per cent taking into account an overall population increase of 2.1 per cent, as compared to a fall of 0 6 per cent in 1976-77.

The substantial increase in national income during 1977-78 was mainly due to the large increase in the production of foodgrains from 11.2 million tonnes in 1976-77 to 125.6 million tonnes in 1977-78. This contributed to an overall increase of 11.2 per cent in the net product of the agriculture sector. All other sectors of the economy also registered increase during 1977–78 as compared to 1976-77, the more important of them are fishing (5.8 per cent), construction (8.0 per cent), banking and insurance (11.1 per cent) and public administration (5.7 per cent). This also resulted in an increase in the share of agriculture sector in total net domestic product. The gross national product, for a population of 629 million, however, stood at an impressive Rs 78,012 crores at current prices.

—The Economic Times

Growth Regulators

Yield barriers can be broken with the use of plant growth regulators. Growth regulators are chemical preparations, which, when applied in small amounts, stimulate or retard germination, flowering, fruit set, fruit growth, ripening and other plant processes. The use of plant growth regulators usually results in higher yields and better quality; They also can improve harvest efficiency by making crops more adaptable to mechanical harvest.

There are five categories of growth regulating chemicals: Auxins promote the growth of plants. Gibberellins produces plant growth and promotes increased fruit size in seedless grapes and stimulate germination during malting. Gytokinins when used with auxins, stimulate cell division. Ethylene generators hasten ripening of harvested fruits such as banana, citrus, honeydew melons, pears, tomatoes, and pineapples. Inhibitor inhibits physiological processes in plants.

Besides increasing yield growth regulators offer the following benefits:

* Prevent lodging of crops.
* Increase hardiness to cold and drought.
* Set fruit earlier.
* Alter shape of plants to a more desirable size, conformation, etc., to facilitate use of mechanical harvesters.
* Correct variations of fruit production in alternate years.
* Make fruit more attractive to the eye.
* To induce male sterility - as an aid in developing hybrid wheat, alfalfa.
* To increase protein or essential amino acids in plants.
* To prevent seed formation as an aid in weed control and to reduce mowings on roadways.

Daminozide, Ethephon Chlormequat, Maleic Hydrazide and Gibberellic acid are currently marketed under various names in U.S.A. —World Farming.

Mushroom Culture

There are hundreds of varieties of mushrooms that grow wild in every country and are being consumed by man. About 80 species are eaten by people in India. The prized mushroom "Guchhi (Morels)" fetches high price in the International Market and are exported by India. Some of the edible varieties are being domesticated.

The richest source of protein, containing most of the essential amino-acids required by man is mushroom. Its protein is equal to muscle protein in quality and is highly digestible. From 3 kgs. of dry wheat straw 1kg. of fresh mushrooms can be produced. Mushroom farms can be built on waste or unarable lands.

— Farmer and Parliament

A. V. THOMAS GROUP COMPANIES

THE NELLIAMPATHY TEA & PRODUCE COMPANY LIMITED

Registered Office:		W-21/674, Beach Road Post Box No. 47 ALLEPPEY - 688 001	
Manalaroo Estate Padagiri P. O. (Via) Nemmara Palghat Dist.	-	Area under Cardamom	407 Hects.

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Arnakal Estate Vandiperiyar P. O.	-	Area under Cardamom	294 Hects.

THE KALPETTA ESTATES LTD.

Registered Office:		W-21/674, Beach Road Post Box No. 47 ALLEPPEY - 688 001	
Chulika Estate Meppadi P. O. Kozhikode Dist.	-	Area under Cardamom	206 Hects.

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